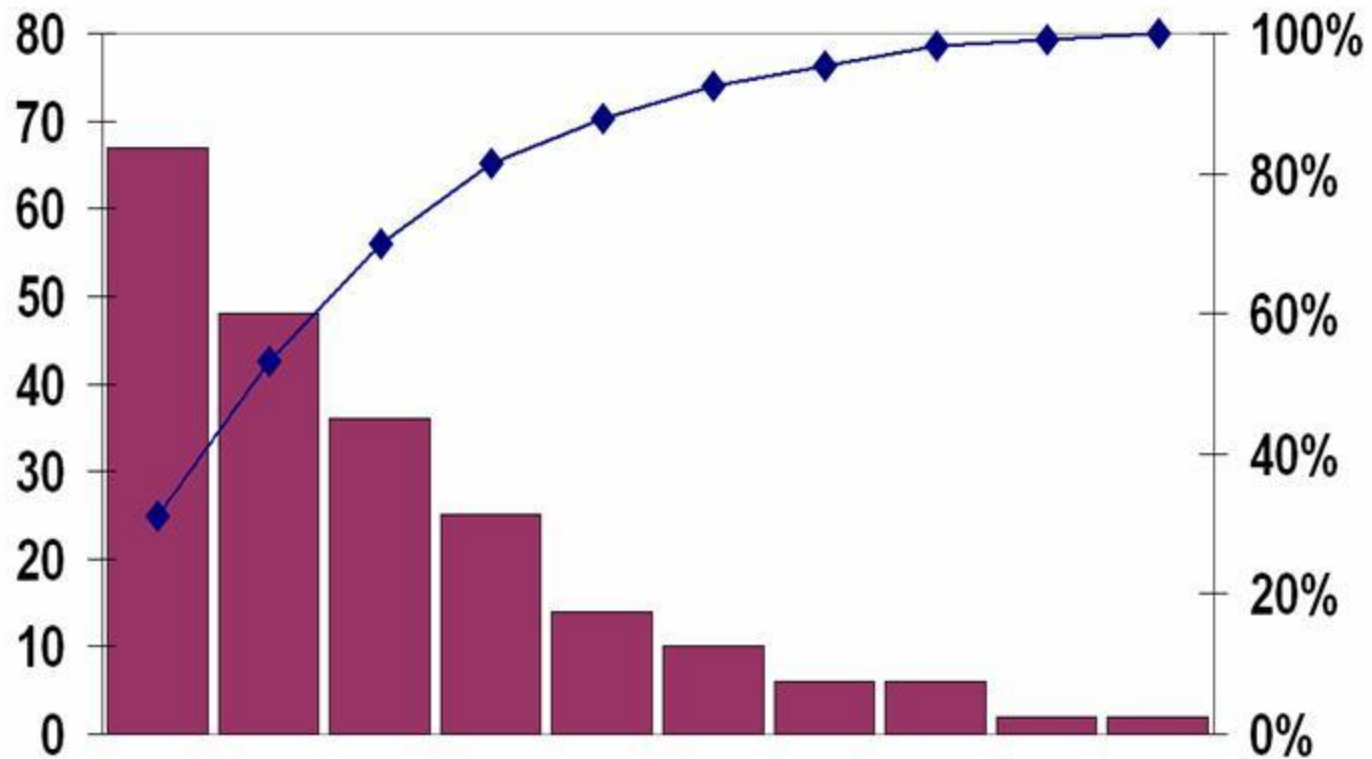


Pareto Chart

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Pareto Chart



Vilfredo Pareto

Italian economist

1848 – 1923

Analyzed data and found that
in Italy 80% of the land was owned
by 20% of the population.

Important Few – Trivial Many

80/20 rule

By focusing on the few major causes the vast majority of the issue will be resolved.

Once the majority issues are resolved it is time to re-evaluate the issue.

or

Once the boulders in the river (inventory) are removed then the river can be lowered (reduced inventory) and it can flow faster and unobstructed (Takt time and inventory reduction).

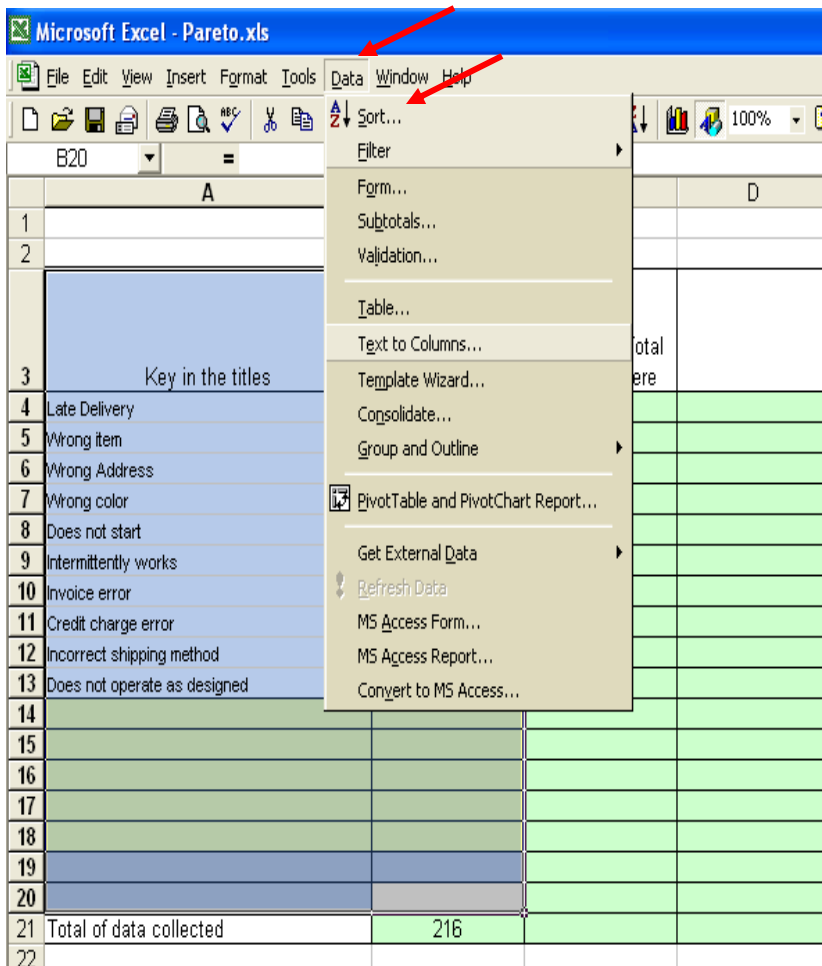
Creating a Pareto chart

1. Define process to monitor.
 2. Brainstorm categories for data collection.
 3. Establish data collection time frame (will this bias data?)
 4. Chose 7-15 categories (may be combined later)
 5. Collect at least several hundred data points if possible.
- Customer Complaints
 - Late Delivery
 - Wrong item
 - Wrong Address
 - Wrong color
 - Does not start
 - Intermittently works
 - Invoice error
 - Credit charge error
 - Incorrect shipping method
 - Does not operate as designed

Collect data

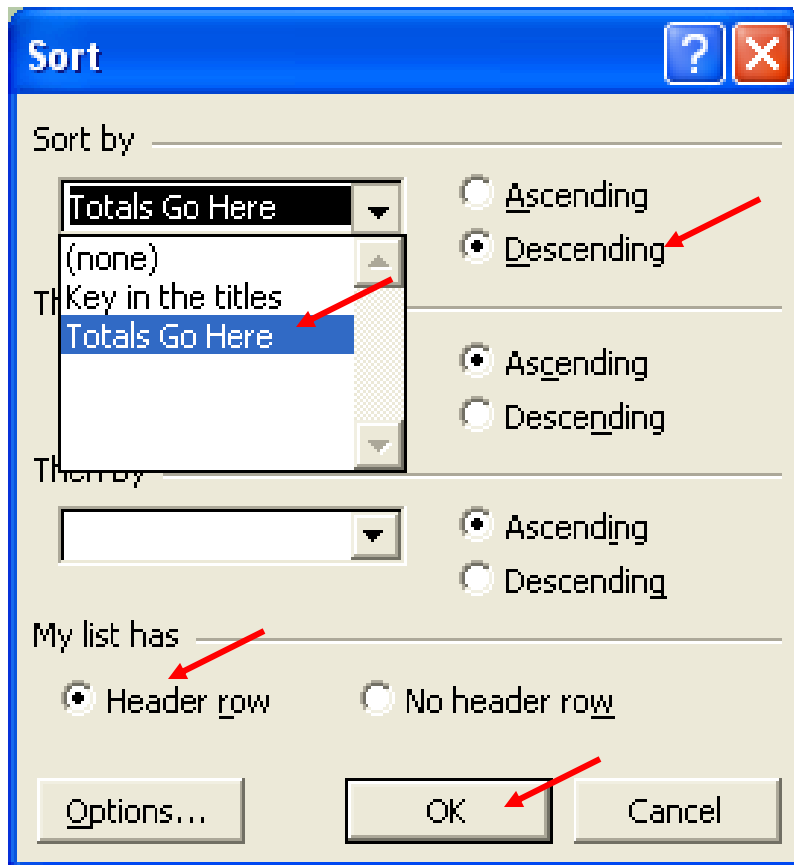
- Here is the tallied data
- Customer Complaints
 - 10 Late Delivery
 - 25 Wrong item
 - 48 Wrong Address
 - 3 Wrong color
 - 67 Does not start
 - 2 Intermittently works
 - 6 Invoice error
 - 14 Credit charge error
 - 36 Incorrect shipping method
 - 6 Does not operate as designed

Sort Data



- Highlight data with columns A and B to just above the total.
- Click on “**Data**” then “**Sort**”

Sort instructions



Click on
“**header row**” and use
pull down for
“**Totals go here**” and
select **Descending**.

Entering percentage calculations

3	Key in the titles	Totals Go Here	Percent of Total Displays Here
4	Does not start	67	
5	Wrong Address	48	
6	Incorrect shipping method	36	
7	Wrong item	25	
8	Credit charge error	14	
9	Late Delivery	10	
10	Invoice error	6	
11	Does not operate as designed	6	
12	Wrong color	2	
13	Intermittently works	2	
14			
15			
16			
17			
18			
19			
20			
21	Total of data collected	216	

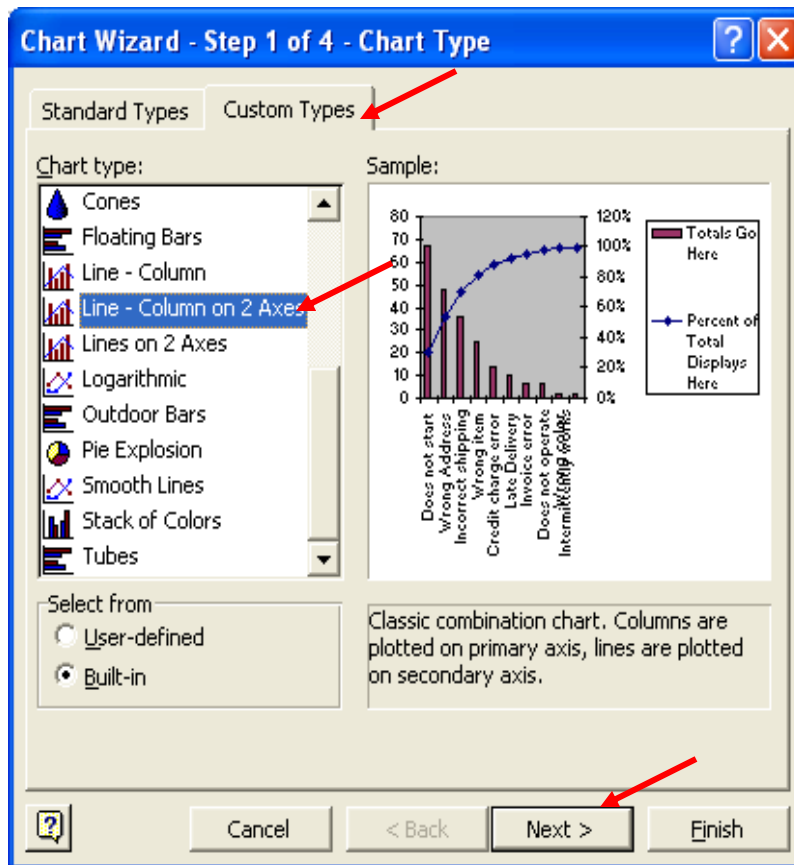
- Enter formula **=B4/\$B\$21** Into C4.
- Enter **=B5/\$B\$21+C4** into C5.
- Now drag down the formula to fill the remainder of the data. (Or highlight c5 through c13 and use command **Edit->fill->down**)
- Highlight column C and format to be a percent by clicking the “%” from the toolbar.

See formulas in the right inset.

2			
3	Key in the titles	Totals Go Here	Percent of Total Displays Here
4	Does not start	67	31%
5	Wrong Address	48	53%
6	Incorrect shipping method	36	70%
7	Wrong item	25	81%
8	Credit charge error	14	88%
9	Late Delivery	10	93%
10	Invoice error	6	95%
11	Does not operate as designed	6	98%
12	Wrong color	2	99%
13	Intermittently works	2	100%
14			
15			
16			
17			
18			
19			
20			
21	Total of data collected	216	

3	Key in the titles	Totals Go Here	Percent of Total Displays Here
4	Does not start	67	=B4/\$B\$21
5	Wrong Address	48	=B5/\$B\$21+C4
6	Incorrect shipping method	36	=B6/\$B\$21+C5
7	Wrong item	25	=B7/\$B\$21+C6
8	Credit charge error	14	=B8/\$B\$21+C7
9	Late Delivery	10	=B9/\$B\$21+C8
10	Invoice error	6	=B10/\$B\$21+C9
11	Does not operate as designed	6	=B11/\$B\$21+C10
12	Wrong color	2	=B12/\$B\$21+C11
13	Intermittently works	2	=B13/\$B\$21+C12
14			

Creating a chart



- Highlight data in columns A, B, and C
- Select chart icon. Choose “Custom Types” and select “Line-Column on 2 axis”.

Chart Creation steps

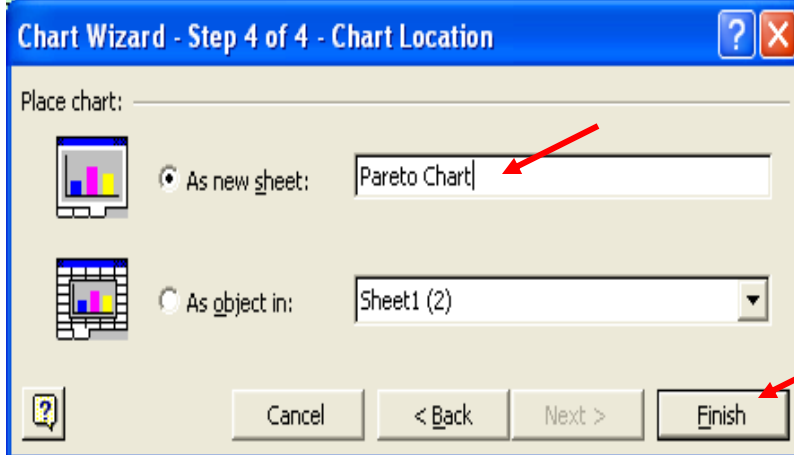
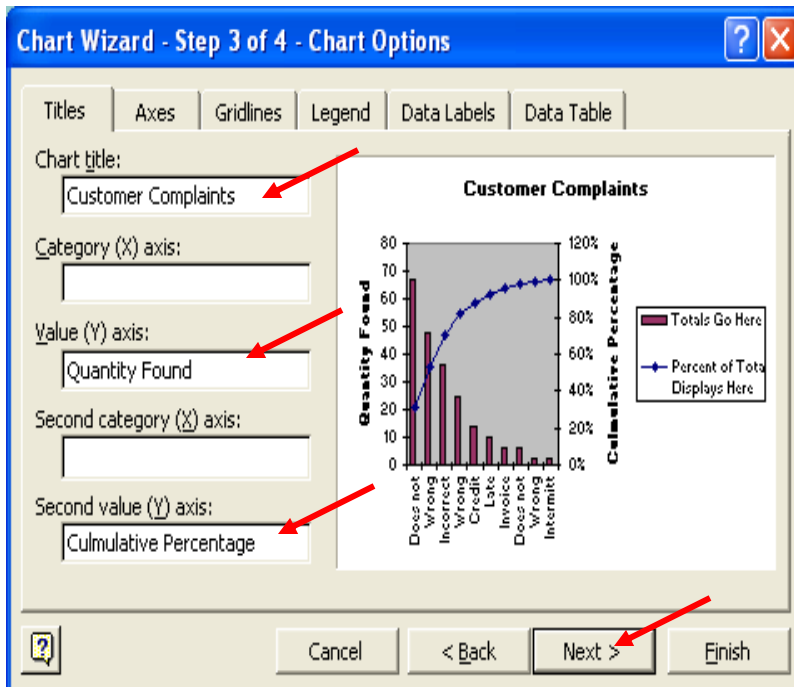
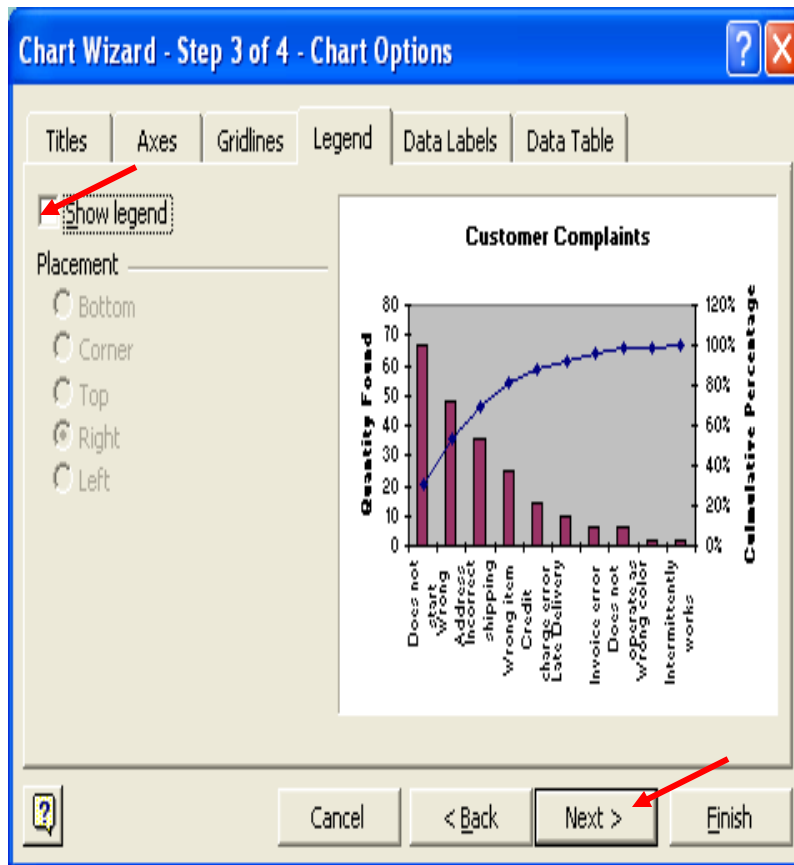


Chart Creation wizard



- Using Legend tab. De-select “Show Legend”

Chart creation

Chart Wizard - Step 3 of 4 - Chart Options

Titles | Axes | Gridlines | Legend | **Data Labels** | Data Table

Data labels

- None
- Show value
- Show percent
- Show label
- Show label and percent
- Show bubble sizes

Legend key next to label

Customer Complaints

Complaint Type	Quantity Found	Cumulative Percentage
Does not start	67	31%
Wrong Address	48	53%
Incorrect shipping method	36	70%
Wrong item	25	81%
Credit charge error	14	88%
Late Delivery	10	93%
Invoice error	6	98%
Does not operate as designed	6	99%
Wrong color	2	99%
Intermittently works	2	100%

Cancel | < Back | **Next >** | Finish

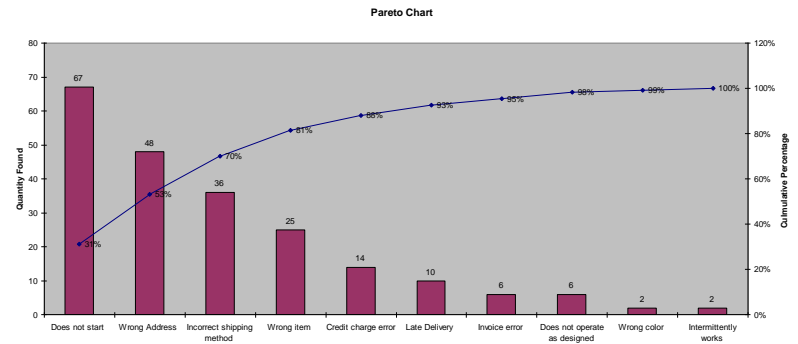
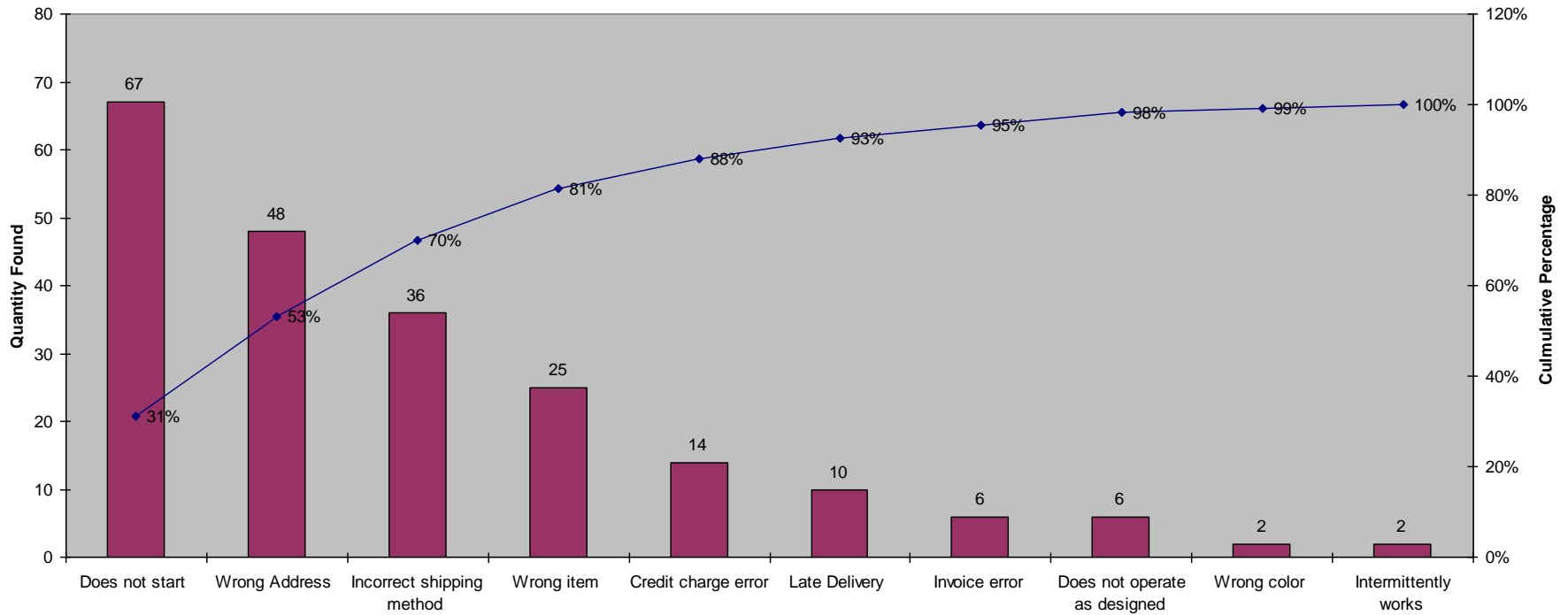


Chart before formatting

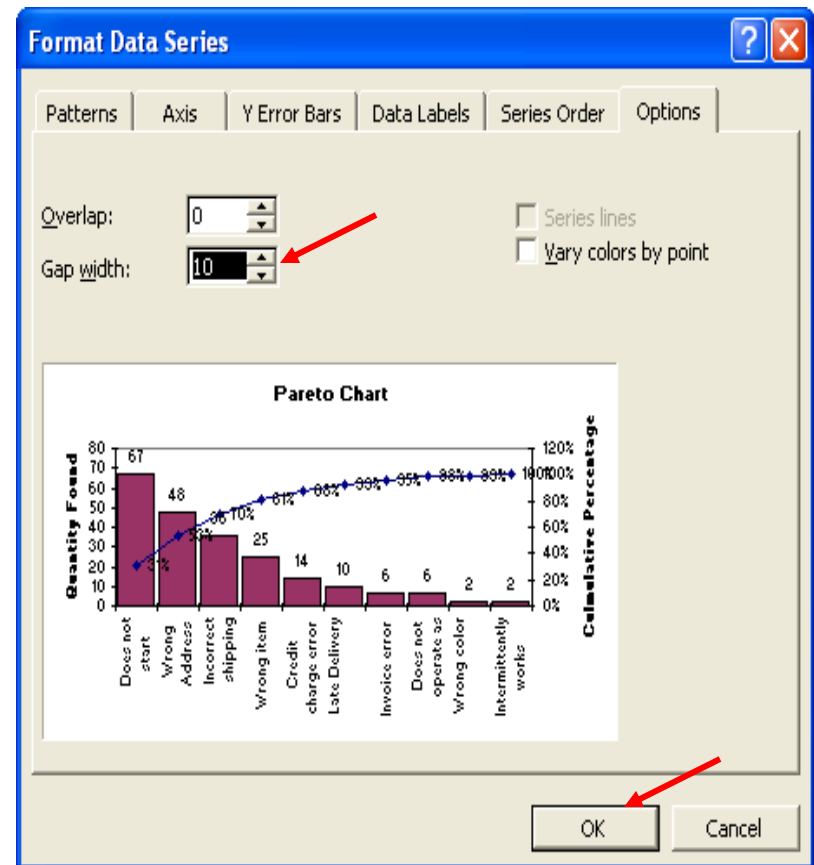
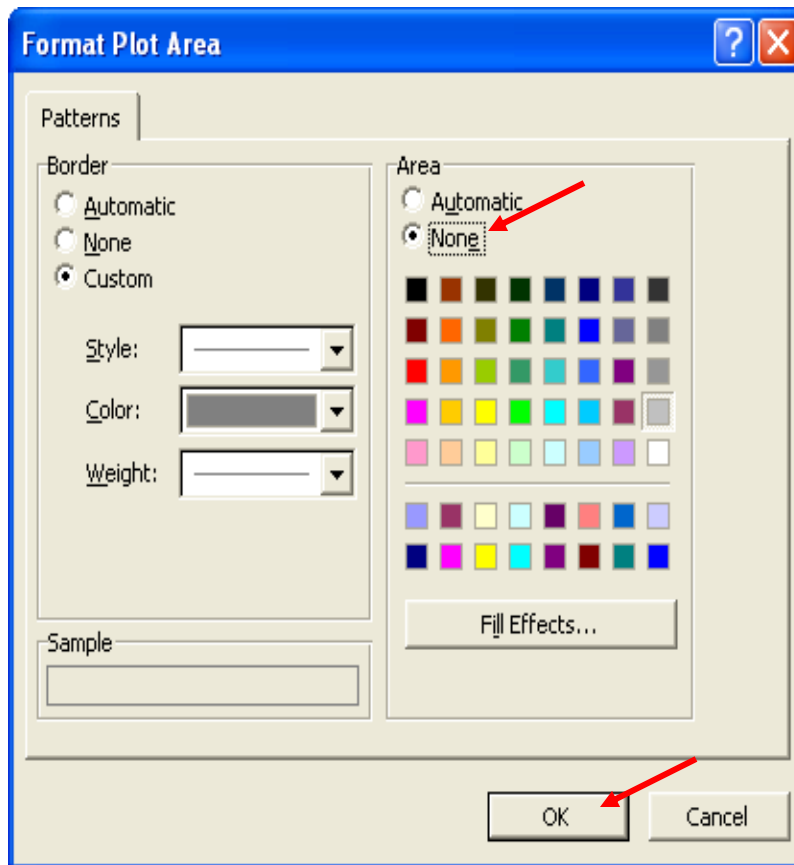
Pareto Chart



Format adjustments

- Right click the background of the chart and select “format plot area” and click “None”.
- Click on bar graph and then right click “options” and change gap width value to 10.
- Click on titles and change them to be at least 16 font.
- Click on the X axis then right click and click alignment as shown.
- Change font on data labels and categories to be bold
- Right click on the right axis and change scale to 1.0 max.

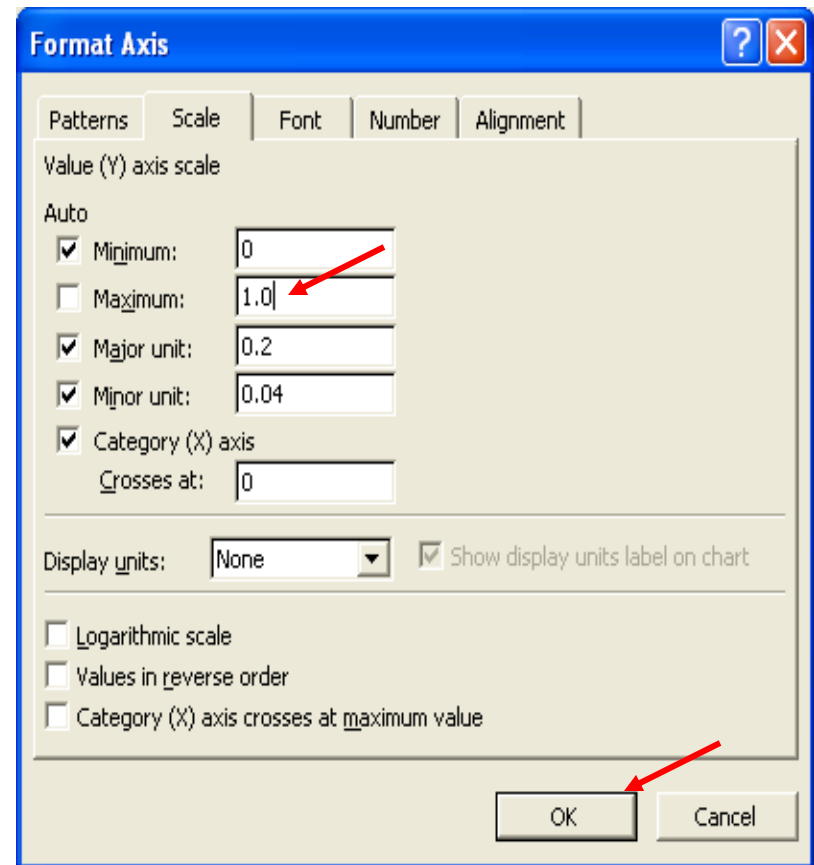
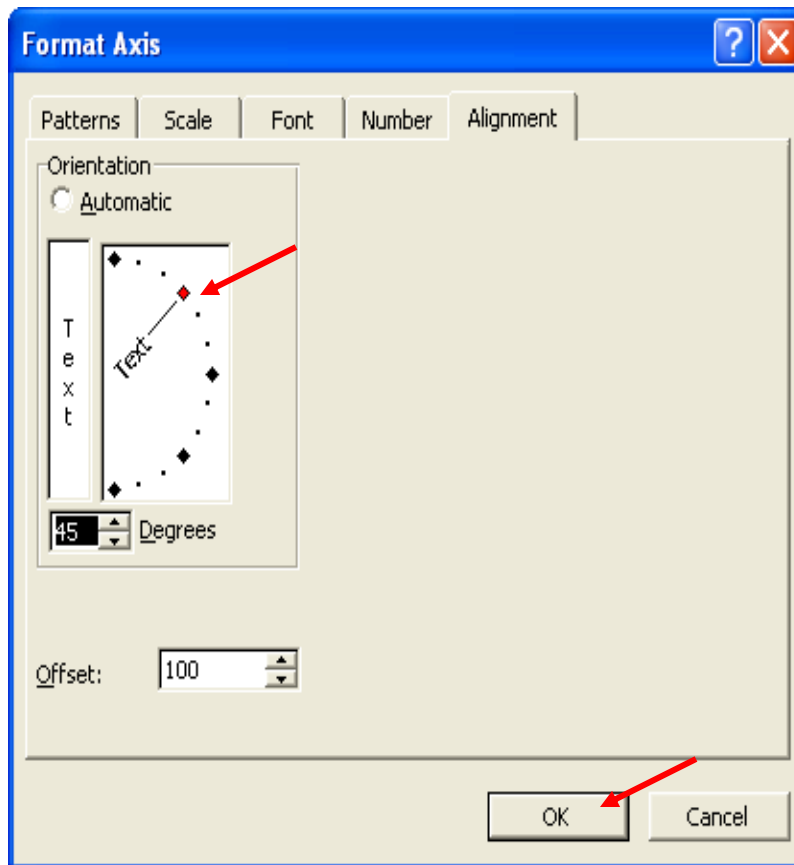
Formatting continued



Formatting continued

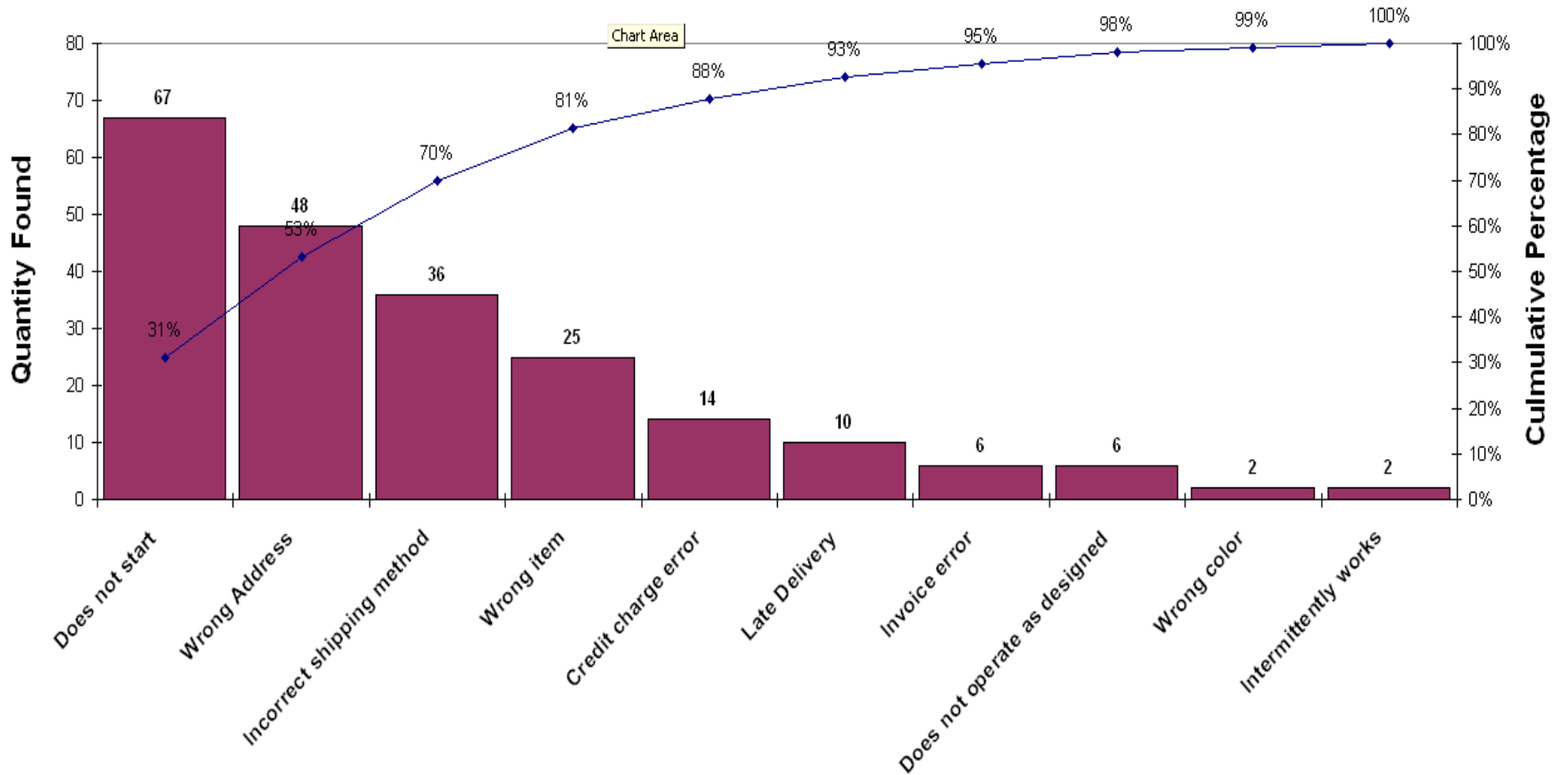
X-axis

2nd Y axis

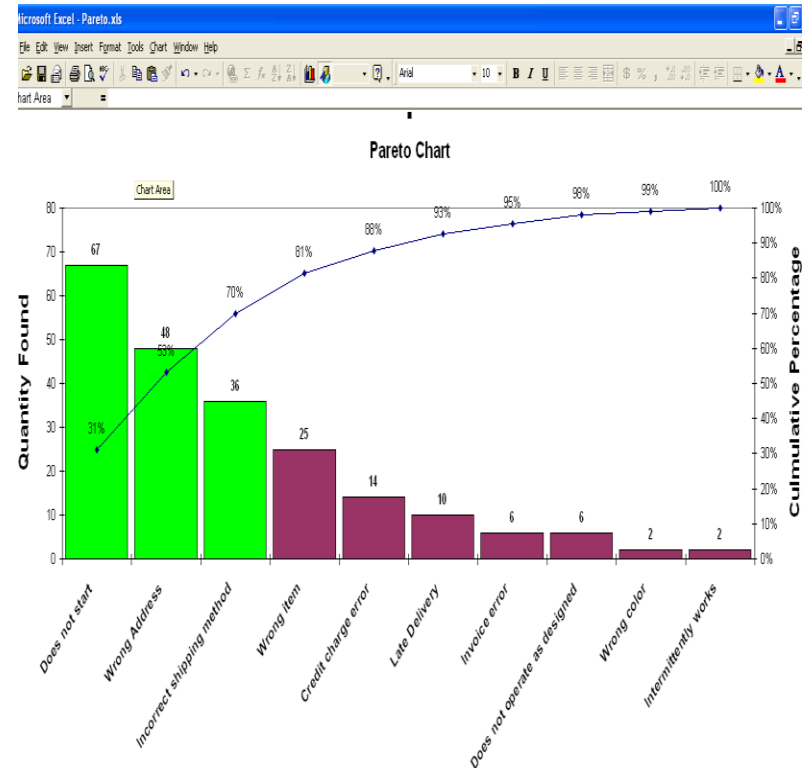
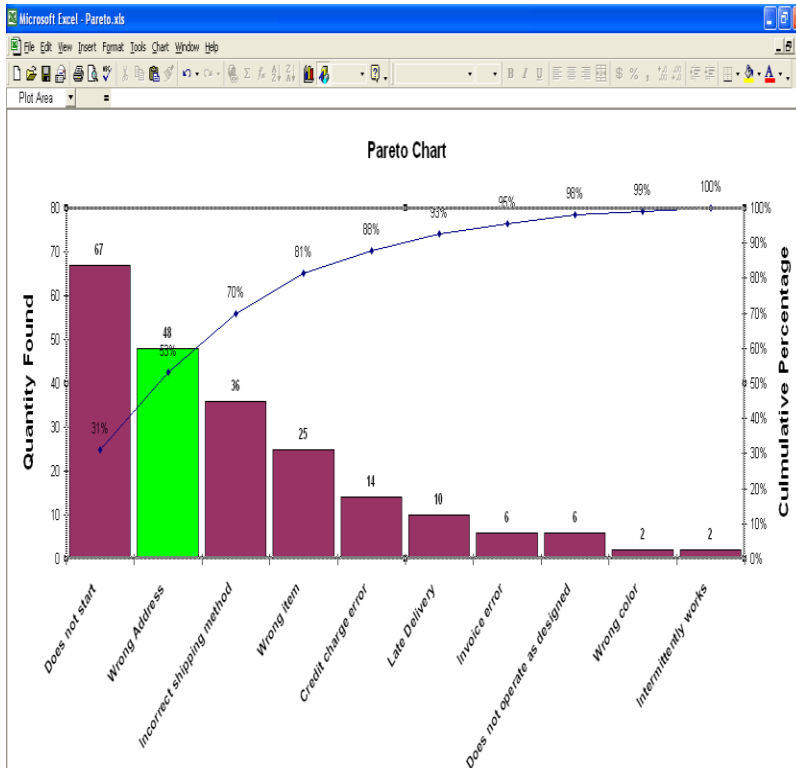


From the chart you can see that the top 3 (30%) categories are 70% of the total complaints.

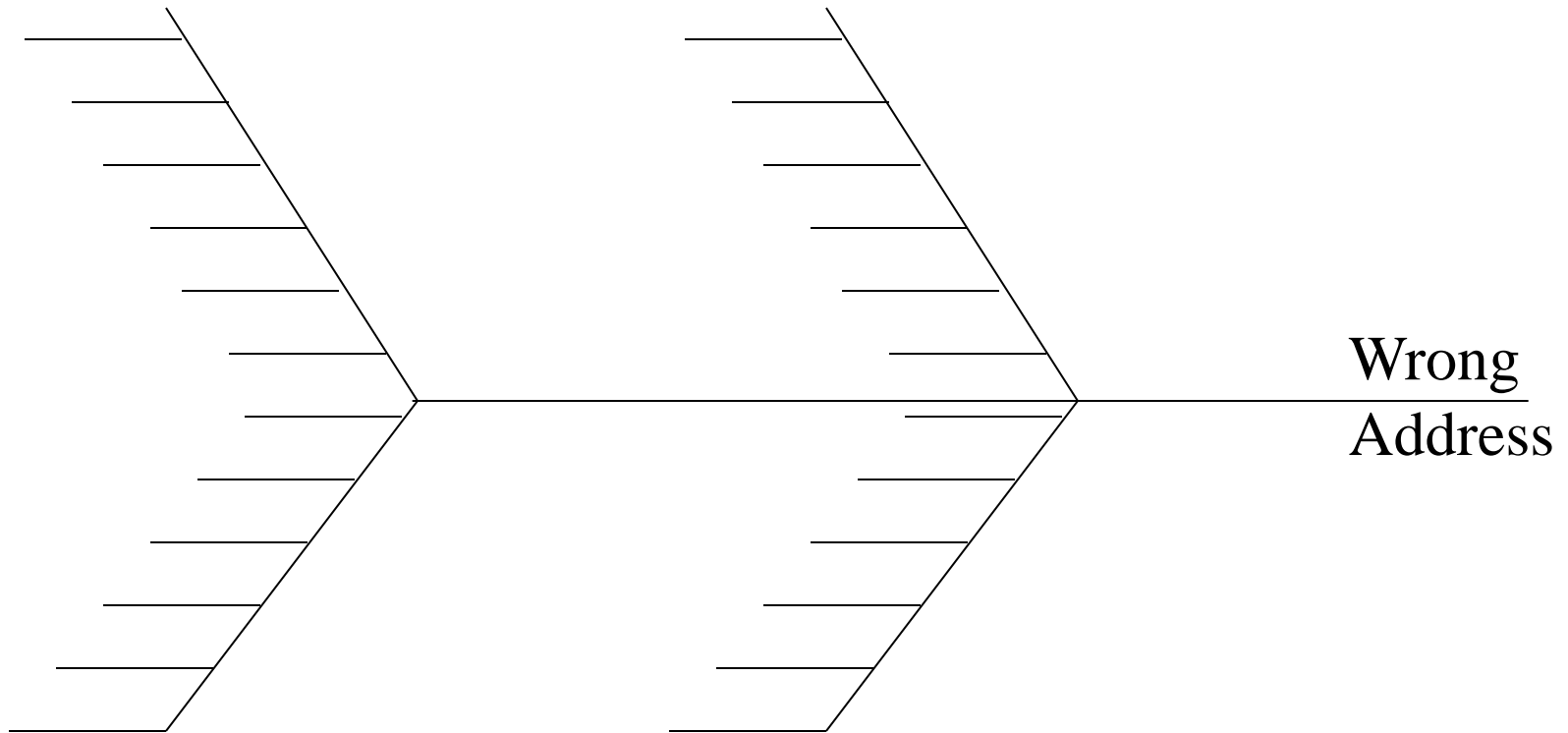
Pareto Chart



If desired you can modify format of individual or multiple points. Two slow clicks on an individual point then right clicking opens the dialog box “**format data point**”.



Now use Fishbone diagram and brainstorming techniques to formulate a plan for the issues identified.



Thank You

Paul Klein

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